

OIB - P-3 Orion - WFF 04/09/19 Science Report

Aircraft: [P-3 Orion - WFF \(See full schedule\)](#)

Date: Tuesday, April 9, 2019

Mission: OIB

Mission Location: North Bed Gap 01

Mission Summary:

Mission: North Bed Gap 01

Priority: High

This new mission for 2019 addresses gaps in bed measurements identified by Mathieu Morlighem on the northern and northeastern flank of the ice sheet. We also fly two short flowlines in the vicinity of Steensby and Ryder Glaciers at the request of MacGregor et al, with the purpose of recovering thickness, and possibly layering, in an area with the best surface exposure of pre-Holocene ice in all of Greenland. This data would enable future modeling there to support a possible "horizontal ice core" effort. Finally, we fly a line across the margin of the Hiawatha ice lobe and across a river channel in its proglacial area, at the request of Larry Smith.

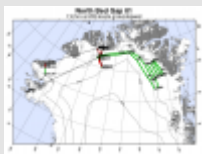
A mixed forecast today across the region led us to head northeast today and cover some new ground. To our mild surprise, this mission turned out to be a near-perfect match for the conditions we encountered. Clouds west of the divide dissipated as we descended to begin the survey of bed gaps in north and northeast Greenland. The bed gap lines proceeded uneventfully in MCoRDS swath mode and then we proceeded to fly two flowlines, terminating in Warming Land, in MCoRDS nadir profiling mode to offer the best opportunity to detecting internal layering. Due to thin snow cover there, we were also able to observe the dusty layering associated with Last Glacial Period ice at the ice margin. We then transited over Steensby and Petermann Glaciers to perform a short survey perpendicular to the ice margin in Inglefield Land west of Hiawatha Glacier in support of Larry Smith's hydrology project. During this transit, clouds returned and we climbed above them near Petermann Glacier. They cleared in time for us to spot the Keybird wreck again, but returned over Humboldt Glacier and dissipated again just in time for the Inglefield Land transect. Headwall continues to have minor freezing issues and the same Applanix IMU malfunctioned later on than yesterday, but ATM has a good lead on a resolution. Otherwise, all instruments performed well and ATM reports 99% laser altimetry collection. Due to low ceilings at Thule, we did not perform a ramp pass.

Attached images:

1. Map of today's mission (John Sonntag / NASA)
2. The bed gaps filled by today's mission (white line) through highs in bed elevation uncertainty, where red saturates at 500 meters uncertainty (Joe MacGregor / NASA)
3. Snow-filled crevasse field upstream of Ryder Glacier (Jeremy Harbeck / NASA)
4. Margin of the Greenland Ice Sheet abutting Warming Land (Jeremy Harbeck / NASA)
5. Contrast-stretched view of the margin of the Greenland Ice Sheet abutting Warming Land, just east of Steensby Glacier. Brown layers signify dusty ice from colder intervals (stadials) during the Last Glacial Period, and this outcrop represents a location with potentially some of the oldest ice exposed at the surface in Greenland. While the colors in this image are adjusted, these layers were visible to the naked eye. (Joe MacGregor / NASA)

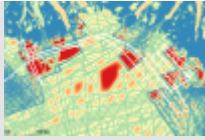
Images:

Map of today's mission



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The bed gaps filled by today's mission (white line) through highs in bed elevation uncertainty, where red saturates at 500 meters uncertainty



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Snow-filled crevasse field upstream of Ryder Glacier



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Margin of the Greenland Ice Sheet abutting Warming Land



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Contrast-stretched view of the margin of the Greenland Ice Sheet abutting



[Read more](#)

Submitted by: Joseph MacGregor on 04/09/19

Related Flight Report:

P-3 Orion - WFF 04/09/19

Flight Number: #2076: 2019 OIB Science Flight #5

Payload Configuration: Operation IceBridge

Nav Data Collected: No

Total Flight Time: 7.8 hours

Submitted by: Kelly Griffin on 04/09/19

Flight Segments:

From:	BGTL	To:	BGTL
Start:	04/09/19 10:52 Z	Finish:	04/09/19 18:40 Z
Flight Time:	7.8 hours		
Log Number:	19P017	PI:	Joseph MacGregor
Funding Source:	Bruce Tagg - NASA - SMD - ESD Airborne Science Program		
Purpose of Flight:	Science		
Miles Flown:	2045 miles		

Flight Hour Summary:

						19P017
Flight Hours Approved in SOFRS						250
Total Used						216.3
Total Remaining						33.7
19P017 Flight Reports						
Date	Flt #	Purpose of Flight	Duration	Running Total	Hours Remaining	Miles Flown
03/26/19	#2053: 2019 OIB ATF	Check	0.9	0.9	249.1	0
03/27/19	#2059: 2019 OIB PTF-Laser	Check	2.3	3.2	246.8	0
03/28/19	#2061: 2019 OIB PTF-Radar	Check	3.2	6.4	243.6	0
04/01/19	#2068: 2019 OIB WFF-BGTL Transit Flight	Transit	6.9	13.3	236.7	2458
04/03/19	#2070: 2019 OIB Science Flight #1	Science	7.6	20.9	229.1	1938
04/05/19	#2072: 2019 OIB Science Flight #2	Science	7.7	28.6	221.4	1910
04/06/19	#2073: 2019 OIB Science Flight #3	Science	7.2	35.8	214.2	2000
04/08/19	#2075: 2019 OIB Science Flight #4	Science	6.9	42.7	207.3	1780
04/09/19	#2076: 2019 OIB Science Flight #5	Science	7.8	50.5	199.5	2045
04/10/19	#2081: 2019 OIB Science Flight #6	Science	10.1	60.6	189.4	2702
04/11/19	#2082: BGSF-BGTL Transit	Transit	2.2	62.8	187.2	696
04/12/19	#2083: 2019 OIB Science Flight #7	Science	7.2	70	180	2109
04/15/19	#2086: 2019 OIB Science Flight #8	Science	4.8	74.8	175.2	1243
04/16/19	#2087: 2019 OIB Science Flight #9	Science	7.6	82.4	167.6	2036
04/17/19	#2088: 2019 OIB Science Flight #10	Science	7.7	90.1	159.9	1937
04/18/19	#2090: 2019 OIB Science Flight #11	Science	7.8	97.9	152.1	2008
04/19/19	#2091: 2019 OIB Science Flight #12	Science	7.6	105.5	144.5	2104
04/20/19	#2092: 2019 OIB Science Flight #13	Science	6.9	112.4	137.6	0
04/22/19	#2094: 2019 OIB Science Flight #14	Science	6.6	119	131	1867
04/23/19	#2099: 2019 OIB Science Flight #15	Science	7.7	126.7	123.3	1979
04/25/19	#2102: 2019 OIB BGTL-KBGR Transit Flight	Transit	6.2	132.9	117.1	0
04/26/19	KBGR to BGSF Transit	Transit	5.7	138.6	111.4	0
05/05/19	2019 OIB Science Flight #16	Science	7.8	146.4	103.6	0

05/06/19	2019 OIB Science Flight #17	Science	8.4	154.8	95.2	0
05/07/19	2019 OIB Science Flight #18	Science	8.5	163.3	86.7	0
05/08/19	2019 OIB Science Flight #19	Science	8	171.3	78.7	0
05/12/19	2019 OIB Science Flight #20	Science	9	180.3	69.7	0
05/13/19	2019 OIB Science Flight #21	Science	7	187.3	62.7	0
05/14/19	2019 OIB Science Flight #22	Science	7.9	195.2	54.8	0
05/15/19	2019 OIB Science Flight #23	Science	8.3	203.5	46.5	0
05/16/19	2019 OIB Science Flight #24	Science	6.3	209.8	40.2	0
05/17/19	2019 OIB Transit	Transit	6.2	216	34	0
05/17/19	2019 OIB Transit	Transit	0.3	216.3	33.7	0

Flight Reports began being entered into this system as of 2012 flights. If there were flights flown under an earlier log number the flight reports are not available online.

Page Last Updated: April 22, 2017

Page Editor: Brad Bulger

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